

WIND FEASIBILITY STUDY

Prepared for:

Alameda County
1221 Oak Street
Oakland, California 94612

Prepared by:

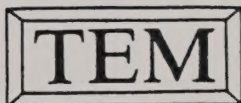
TEM Associates, Inc.
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May 3, 1982

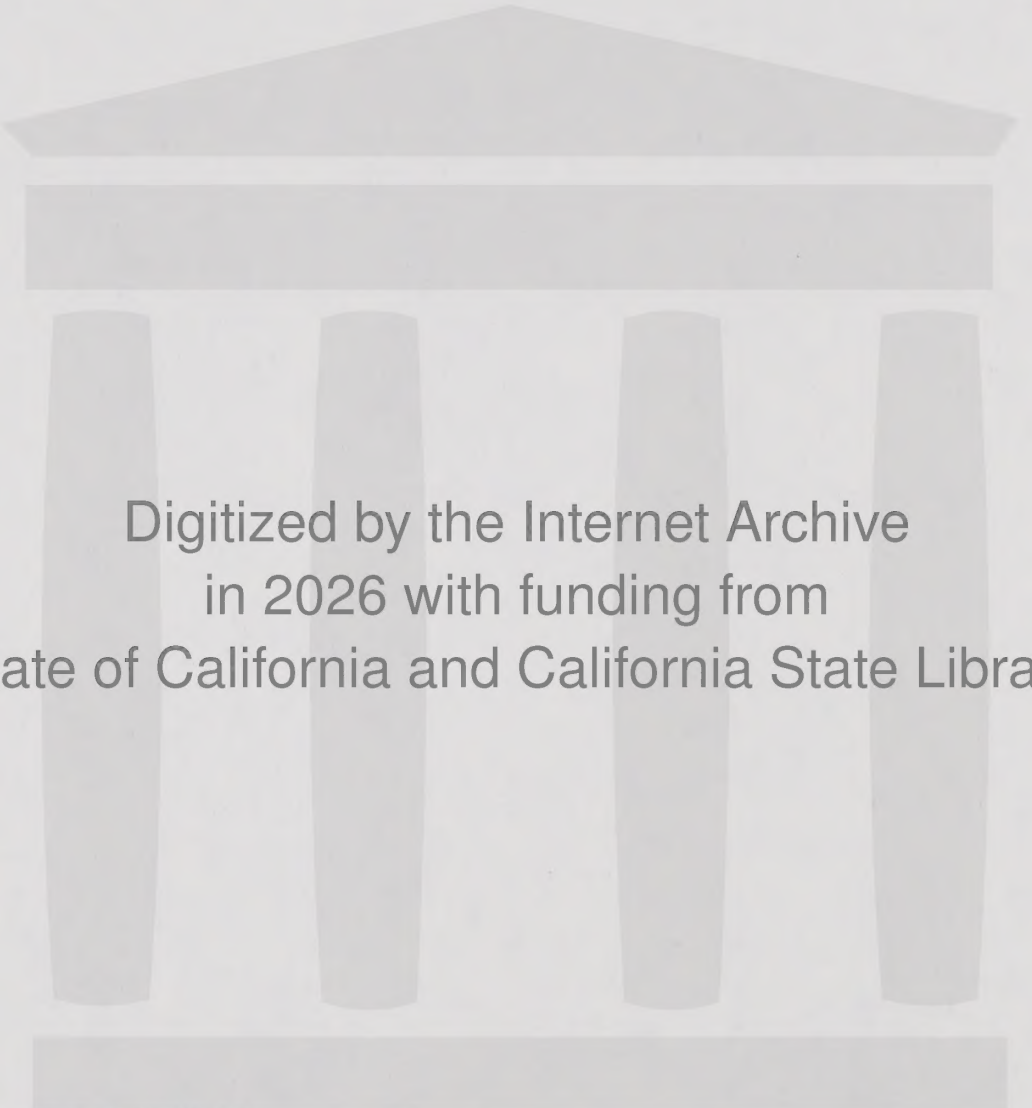
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INTRODUCTION

TEM Associates is pleased to submit this proposal to Alameda County to perform a feasibility study regarding the utilization of wind energy resources as a means of reducing the county's electricity costs. The proposed study will investigate the extent of the county's wind resources and will assess the suitability of various available wind machines. Equally important, the study will develop and analyze various economic scenarios for financing wind projects. This proposed study will be six weeks long and will require a budget of \$10,000.

BACKGROUND

As is the case with many public agencies and private businesses, Alameda County is experiencing financial problems. In fact in the current fiscal year, county expenses are expected to exceed revenues by more than \$10 million. This financial shortfall is exacerbated by rising costs in many budgetary areas. Specifically, the county's utility expenses have increased dramatically in recent years and this sharp increase is expected to continue in the foreseeable future.

Although energy costs are rising, the county is trying to minimize the fiscal impact of rate increases by instituting strict conservation measures and by tapping other sources of energy, e.g., solar systems for hot water, and cogeneration systems for both heat and electricity.

There is, however, an alternate source of energy the county has not yet developed--the wind. Numerous federal, state, and private wind assessments show that Alameda County is the location of one of California's prime sites for wind energy development, the Altamont Pass. The potential in this area is evidenced by the two wind farms now under development and the others in the planning stages. Moreover, Altamont Pass is not be the only site in the county suitable for wind machines. With its varied terrain of coastal hills and bay-level plains opposite the Golden Gate, the county seems rich in potential locations to exploit the wind.

THE PROPOSED STUDY

In order to develop the full potential of wind as a source of energy for the county, a significant amount of information must still be gathered and several critical issues resolved. In particular, information on two subjects is crucial to developing wind energy for Alameda County. First, the best sites must be identified, and the amount of wind energy at each determined. Second, possible financing schemes must be investigated to determine the economic benefit lf the proposed project to the county as well as the most efficient use of limited county funds. TEM Associates proposes to investigate these two major areas in tnis feasibility study for the county. The result will be a guide for county officials in how to implement the harvesting of Alameda County's wind resources.

Specifically, TEM proposes to carry out four major tasks:

- I. The company will gather technical and economic information on existing as well as proposed wind projects in the state. This information will then be compared with the county's energy demand to provide a preliminary estimate of how much wind could contribute to the county's electricity supply. This task will also include contacting PG & E to determine the extent to which the utility will cooperate with the county in this endeavor.
- II. From available wind data, the most attractive sites will be identified, and a plan will be developed to gather additional data on the wind energy at those sites, and to determine the availability and cost of land for wind development at these sites.
- III. TEM will evaluate possible approaches to financing and the availability of outside funding sources in order to determine the most economical method of financing a county wind project. A variety of services will be investigated, and a combination of public and private participation will be analyzed.
- IV. TEM will study the commercially available wind machines and recommend the ones best suited to the county's applications. Additionally, other technical issues needing further study will be identified.

These four tasks are outlined in the attachment.

Upon completion of this feasibility study, Alameda County will know:

- 1) Whether wind energy can now economically provide part of the county's electricity needs;
- 2) Practical and workable ways to finance such a project;
- 3) The most attractive sites for a wind project;
- 4) The additional data required and issues needing resolution in order to proceed with the project.

PROJECT TEAM

To accomplish this study, TEM has assembled an interdisciplinary team comprised of company personnel supported by technical and financial experts in wind energy development. The Principal-in-Charge will be Dr. Berah D. McSwain, TEM President. Project Manager will be Thomas L. Chester, a TEM employee. Mr. Chester is a registered engineer and has a decade of experience in several areas of alternative energy sources, including wind energy development. Providing additional technical expertise will be Dr. Otto Smith, a professor at the University of California, Berkeley, and a well-known specialist in wind energy. Also included in the TEM team is Albert Goldschmidt, a senior financial consultant with the San Francisco brokerage firm of Burr, Wilson Co., Inc. Mr. Goldschmidt has been involved in many aspects of municipal financing and has a long-time interest in alternate energy sources as investment opportunities. Alan Gould, Vice President and General Counsel of TEM will be responsible for the project's legal and contractual analysis. Leslie May, an Associate of TEM, will contribute his extensive experience in wind machine siting, installation and

evaluation, and Bernard Choden will assist in the planning and land use aspects of the project. The resumes of the TEM team are attached.

PROJECT SCHEDULE

TEM will begin work within one week from notification of contract award and will complete the study within six weeks after that. The deliverables will be a mid-way progress report and a final report. The final report will contain the data gathered regarding both potential sites and wind machines. It will also include a summary of each financing scheme TEM investigates as well as a cost-benefit analysis for various combinations of wind machines, sites, and financing scenarios.

PROJECT COST

For this work, TEM requests that a fixed-fee contract for \$10,000 be awarded and paid in three installments: \$3,000 upon contract award, \$3,000 upon the county's receipt of the mid-way progress report, and \$4,000 upon submittal of the final report. The budget and schedule for the proposed work are also attached.

OUTLINE OF PROPOSED FEASIBILITY STUDY FOR A WIND ENERGY PROJECT
IN ALAMEDA COUNTY

I. INFORMATION GATHERING

- A. Review of current and proposed wind energy projects throughout California from technological and cost/benefit perspectives.
- B. Review and evaluate the demand for energy by Alameda County that can be met or offset by wind power development and estimated cost benefits.
- C. Review PG & E projections and plans for utilizing, supporting, and developing an Alameda County wind-energy project.

II. SITE ANALYSIS

- A. Survey available wind data on Alameda County: PG & E, Energy Commission, National Weather Service, private sources, etc.
- B. Identify potential county locations with high annual wind energy. Develop Wind Assessment plan to gather and refine further data for selection of potential sites.

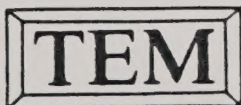
III. ECONOMIC COSTS AND BENEFITS ANALYSIS

- A. Develop cost/benefit scenarios for wind farms of various numbers and sizes of wind machines. Acquisition options and availability of land at appropriate sites will be investigated.
- B. For each scenario, study and evaluate possible funding sources and/or financing approaches and determine the most efficient use of limited county resources.
 - 1. Public vs. private ownership of wind machines.
 - 2. Lease vs. purchase arrangements.
 - 3. Federal and state tax credits.

IV. TECHNICAL EVALUATION

- A. Based on site and economic studies, perform a technical analysis to determine the type, size, and number of wind machines best suited to the County's needs.
- B. Identify other technical considerations, e.g., transmission lines, noise, safety, etc.

THE TEM APPROACH



Associates, Inc.

THE TEM APPROACH

The method we are proposing for this project is the same effective and economical approach used by TEM for all its clients . It is a simple, proven arrangement under which both our staff and associates are accustomed to working. For each separate project we assemble a team of experts built around a core of in-house managers and professional staff. This permanent staff insures provision of quality services and deliverables to each client. Supplementing the core staff is a select group of associated specialists drawn from industry, academia, and private practice. With this core team of staff and long-term professional associates, we will be able to perform an efficient technical, financial and economic analysis. Our approach has resulted in the performance of all present and past contracts on time, within budget, and with exceptional technical results.

WIND ENERGY SYSTEMS CAPABILITIES

TEM Associates can provide technical expertise to public and private clients in the area of wind energy conversion. TEM's capabilities in this area include research, development and systems design for wind conversion technologies; testing and evaluation of wind technologies; evaluation of regional and local wind resources; economic analysis for specific wind energy applications; and environmental impact analysis of wind energy systems. Many of the staff associates at TEM are professors and researchers who are active in developing wind energy systems. They are experienced in wind-electric and solar electric systems; wind turbine design; computer optimization programs for multi-blade wind turbines, power system state estimation, government policy and economic planning; analysis

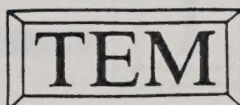
of energy R & D, including energy supply technologies, energy demand and conservation; development of appropriate criteria for assessing the merits of individual technological approaches.

TEM emphasizes the following major concerns of wind energy technology and implementation;

- o Electromagnetic Transmission Interference
- o Noise
- o Safety
- o Siting Problems
- o Zoning and Land Use
- o Ecological Concerns
- o Public Acceptance
- o Legal and Institutional Issues

TEM ASSOCIATES, INC.

APPENDIX: CORPORATE CAPABILITIES



Associates, Inc.

The following are the members of the Board of Directors of the company:

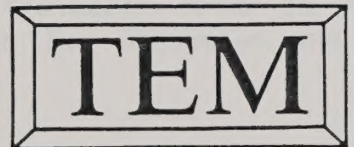
Mr. John L. Smith, President of the company, is a graduate of the University of California, Berkeley, and has been a member of the Board of Directors since 1965. He is currently a member of the Board of Directors of the company and has been a member of the Board of Directors of the company since 1965. He is currently a member of the Board of Directors of the company and has been a member of the Board of Directors of the company since 1965.

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PRINCIPALS

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Associates, Inc.

PRINCIPALS

The Principals of TEM Associates are:

Dr. Berah D. McSwain, President of TEM Associates, holds the Ph.D. degree in Biophysics from the University of California (Berkeley), where he has spent seventeen years in scientific research, teaching, administration, and the development of educational programs. Dr. McSwain's scientific interests encompass energy conservation techniques, biochemistry, microbiology and biophysics. Earlier in his career, he managed engineering laboratories in the aerospace industry and for the Federal government. He has conducted research in optics, spectrophotometry and photosynthesis and has designed optical systems and developed specialized instrumentation for research in both the physical and biological sciences.

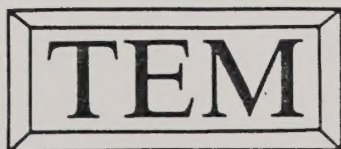
Mr. Alan J. Gould, Vice President of TEM Associates, holds the L.L.M. degree from George Washington University. Mr. Gould has been the General Counsel to Teknekron, Inc., and its affiliates, where he was responsible for all of the company's legal activities; for contract drafting, negotiation and administration; and for the firm's Government Operations Activities Division. As former Contract Manager, Washington Operations, TRW, Inc., Mr. Gould has broad experience in the development, specification and procurement of management information systems, and the development of environmental, energy and strategic planning programs. As Senior Contracting Officer, Ordnance Systems Command, Navy Department, Mr. Gould negotiated and managed major weapons systems acquisitions and contracts ranging to over \$100,000,000. Mr. Gould's expertise in procurement is recognized by ongoing consultancies for the development of Procurement Codes for various municipal, state and federal agencies.

Mr. Andre Pettigrew, Vice President of TEM Associates, holds a degree in Economics and Financial Management from the University of California, Los Angeles. Formerly with the Mobil Oil Corporation, he has since served as a consultant to business, to federal, state and local governments, and to community economic development agencies, rendering technical assistance in the areas of management and economic development. He is an experienced project manager, having successfully managed large dollar and human resource contracts for the Department of Commerce's Minority Business Development Agency and for the Small Business Administration. In addition to working with SBA and MBDA in providing management and technical assistance to business, he has worked with the Federal Railroad Administration, the Community Services Administration, the California Regional Urban Development Corporation, and the Bay Area Business Development Center on similar efforts. His consulting specialties are in the areas of finance, marketing, general management and community economic development.

Mr. Herbert Antzes, Vice President for Washington Operations, holds diplomas in Guided Missile Design and in Executive Computer Management from, respectively, the Massachusetts Institute of Technology and the Department of Defense Computer Institute. Mr. Antzes also has wide experience as a professional trainer. Prior to joining TEM Associates, he was Associate Superintendent for Education and Training for the U.S. Forest Service.

There, he was responsible for curriculum design and development of both the USFS Executive Development System and the Education and Training System. He has also served on the engineering faculty at Rutgers, and as a vice president of an electronics firm. In addition, he has held the positions of Director of Technical and Vocational Educational Programs for the U.S. Marine Corps and of Manager for Training and Development for the U.S. Postal Service.

CORPORATE ADVISORS



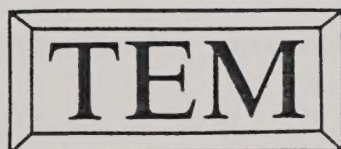
Associates, Inc.

CORPORATE ADVISORS

Dr. George L. Turin, Corporate Advisor to TEM Associates, holds the Sc.D. degree in Electrical Engineering from the Massachusetts Institute of Technology. Dr. Turin has a wide variety of experience in engineering research; product design and production; management of engineering projects; and management of technology-oriented companies. His specialty is communication engineering. Dr. Turin has been Executive Vice President of Insurance Technology Company and has been a staff member of or provided engineering and management consulting services for the following companies/agencies: Arthur Young, Inc.; Edgerton, Germeshausen & Grier, Inc.; Hughes Aircraft Company; Insurance Technology Company; M.I.T. Lincoln Laboratory; Philco Corporation; ROI Consulting, Inc.; SRI International; Teknekron, Inc.; TERA Corporation; U.S. Army Electronics Command; U.S. Marines; Wilton Industries; and Xerox Corporation. Dr. Turin is a Professor in and Chairman of the Department of Electrical Engineering and Computer Sciences, University of California (Berkeley).

Dr. Edward J. Blakely, Corporate Advisor to TEM Associates, holds a joint doctorate in Management and Education from the Departments of of Social Policy, Economics and Management Science of the University of California, Los Angeles. Dr. Blakely's professional experience is in the field of social policy and economic analysis as it relates to economic development. He has done research and acted as a consultant to both the U.S. Government and to international agencies for over a decade on a wide variety of problems related to both urban and rural economic development. He has also served as a strategies and management planning consultant for A & P, Jones and Laughlin Steel, and other corporations. At present, Dr. Blakely holds joint appointments as Professor of Community Development in the Department of City and Regional Planning, University of California, Berkeley, and in the Department of Applied Behavioral Sciences, University of California, Davis. In addition, Dr. Blakely is Assistant Vice President, Academic Personnel, Systemwide Administration, University of California.

ADDITIONAL AREAS OF SPECIALIZATION



Associates, Inc.

AREAS OF SPECIALIZATION

TEM Associates offers a broad spectrum of engineering, science and management services, ranging from short-term technical or management assistance to the execution of complete projects. Interdisciplinary Project Teams can immediately be formed in any of the physical, life, management, or social sciences, as well as to address issues affecting particular technologies. We specialize in accelerating the transfer of the latest research to practical, client-oriented applications.

Our current science and engineering emphases are in the following areas:

- o Energy Conservation
- o Wind Energy Ssytems
- o Toxic Materials and Hazardous Wastes
- o Environmental Analysis
- o Solar Energy Technology

TEM Associates' capabilities in these areas are summarized in the following pages.

SCIENCE AND ENGINEERING

ENERGY CONSERVATION

TEM's staff and Associates have experience in the evaluation of a broad range of energy conservation technologies and issues. TEM Associates is conversant with policy initiatives legislated by Congress in the National Energy Act and policy issues affecting energy and the environment. Close contacts with universities and the national laboratories keep

TEM well-informed about state-of-the-art energy conservation technologies and related issues.

TECHNICAL EVALUATION

TEM Associates can provide architectural and engineering evaluations of existing buildings, industrial processes and energy-consuming equipment. Technologies which would minimize energy consumption can be identified, including retrofit measures and replacement systems. TEM's familiarity with energy-conserving technologies spans a wide range of applications, including residential retrofit technologies, cogeneration, total energy systems, and land management. TEM's technical capabilities in this area also extend to the design of new buildings, industrial processes and technologies. TEM's staff and Associates are conversant with tools for the technical evaluation of energy consumption, including the DOE-2 computer programs for building energy utilization analysis.

ECONOMIC ASSESSMENT

TEM Associates offers expert consulting services for the economic assessment of energy conservation investments and policies. Services provided by TEM in this area include life-cycle cost or rate of return analyses and investment optimization analyses for individual households, utilities, businesses, and governmental agencies. TEM specializes in evaluating the economics of conservation investments in light of existing and anticipated average and marginal energy costs.

TOXIC MATERIALS AND HAZARDOUS WASTES

TEM Associates commands the skills to address the full range of problems which accompany the production, storage, shipment and disposal of toxic and hazardous materials, including nuclear wastes. The solution of

these problems requires a multi-disciplinary capability including scientific, engineering, economic and managerial talent. TEM, by virtue of recently completed projects and its close association with local universities, is particularly suited to performing studies to define and quantify the extent of these relatively new environmental concerns: toxic, hazardous and nuclear wastes.

SCIENTIFIC ASSESSMENTS AND HAZARD QUANTIFICATION

Any successful attempts to define the extent of an overall hazardous waste problem, assess its potential health and economic impacts, and to provide regulations, must rest on a system of definitions and a method of categorizing the thousands of individual toxic materials and hazardous wastes into a manageable number of groups. TEM Associates is able to bring together a team of chemists, chemical engineers, biological scientists and physicists capable of examining the chemical/physical characteristics of materials and wastes and successfully assigning these materials to appropriate degrees of hazard categories. TEM is also able to apply methods and procedures of environmental science, statistics and demography, to assess the risks for the treatment, storage, transport and disposal of hazardous wastes. The science of risk assessment is well-developed and has been used extensively in the nuclear industry. When applied to the problems of hazardous waste, it provides a useful tool for apportioning Research and Development budgets, for designing and siting repositories, and for establishing regulatory priorities.

DISPOSAL ENGINEERING AND RESOURCE RECOVERY

Since hazardous wastes cannot be simply regulated out of existence, technologies must be developed and tested for the safe disposal or, where possible, for the recovery of valuable chemicals and energy products. TEM

Associates has extensive experience and expertise in combustion, pyrolysis, and in biological, chemical and high energy processes, all of which play a role in the disposal of hazardous waste streams. TEM Associates has also conducted a number of studies directed toward examining the scientific and engineering "practicality" of proposed regulations and standards.

TEM's staff also has the experience and capability to perform studies relating to nuclear waste management. This capability pertains both to high-level and low-level wastes. The Company's activities include volume reduction, long-term storage, and determination of the effects of exposure upon materials.

MANAGEMENT SYSTEMS, RECORDS AND DATA MANAGEMENT, AND TRAINING PROGRAMS

A major thrust of TEM Associates has been the application of advanced management and information technologies to the evolving governmental regulatory activities. The focus of this effort has been to help streamline government operations to improve efficiency and cost-effectiveness and to insure meaningful and measurable results. The regulation of toxic and hazardous wastes and the effective administration of the Environmental Protection Agency's Superfund will require management systems which incorporate both the science of management and the experience of individuals with backgrounds in conceiving, implementing, and operating complex governmental programs. TEM's staff and Associates have superior capabilities in developing and administering management programs.

The volume of information and data (technical, geographic, economic, and legal) that obtains for the entire field of toxic and hazardous materials requires not only effective information management, but also, a variety of vehicles for conveying these important items to the appropriate users in both government and industry. TEM is particularly skilled in the

development and implementation of training programs and in designing systems to "target" certain audiences by using available educational resources such as industrial and technical associations, scientific publications and newsletters. Many of the Associates at TEM are distinguished professors and educators, and are skilled in designing and conducting workshops, seminars and highly concentrated "short courses" that would be particularly effective in the dissemination of information about the regulation, control and disposal of hazardous wastes.

LABORATORY ANALYSIS

TEM Associates can provide diverse kinds of laboratory analyses, including those required by EPA under the Safe Drinking Water Act, the National Pollutant Discharge Elimination System, and the Resource Conservation and Recovery Act. TEM's services in this area also include the design and management of environmental sampling programs and laboratories.

MATHEMATICAL MODELING

TEM's staff and Associates are experienced in the application of mathematical models to environmental analysis. TEM's capabilities in this area include dispersion modeling for air quality studies, hydrologic modeling for water quality and resource planning, energy supply and demand forecasting, market penetration modeling, and cost-benefit analyses. The staff is also familiar with sensitivity analysis and methods for treating uncertainty and risk in the interpretation of results.

SOLAR ENERGY TECHNOLOGY

TEM Associates is committed to the effective development and use of renewable energy resources. TEM Project Teams can be assembled to address a wide variety of scientific issues for a broad range of solar energy

applications and systems.

SOLAR HEATING AND COOLING SYSTEMS

TEM Associates can provide architectural and engineering services for the design of cost-effective, innovative solar energy systems for use in building and industrial or agricultural processes. TEM's capabilities in this area include the design of both active and passive solar systems as well as the assessment of solar resources for individuals, businesses and communities.

DAYLIGHTING AND ILLUMINATION ENGINEERING

TEM's capabilities include research, design and development in illumination engineering and daylighting, with special emphasis on lighting hardware, lighting inventories, uses of solar illumination, and the biological effects of light. The staff and Associates have experience in the design of novel illumination systems, design and testing of optical systems and hardware, as well as architectural applications of daylighting.

PHOTOVOLTAIC SYSTEMS

TEM Associates can provide a full range of services to both government and industry to assist in the design, implementation and evaluation of photovoltaic systems to meet specific applications. TEM Associates' expertise can also be applied to the analysis of the commercial feasibility of photovoltaic technologies. TEM's skills in technology assessment, economic analysis and survey research can be used to address this important area.

SOLAR THERMAL ELECTRIC SYSTEMS

TEM's solar energy capabilities include the analysis of economic, technical, engineering and regulatory issues pertaining to solar thermal

BERNARD CHODEN, Associate
TEM Associates, Inc.

EDUCATION: B.A., Architecture (1952), University of
 Michigan

 M.A., City Planning (1954), University of
 Michigan

 Graduate City and Regional Planning (1960-1963),
 Study University of Pennsylvania

PROFESSIONAL HISTORY:

1980-
 Present Senior Project and Program Designer, Department of
 Economic Development, City of Oakland, California.
 Citywide financial redevelopment strategy; project
 and program design for the Central District; high
 technology industry recruitment and development;
 liaison to the University of California and State
 Legislature.

1978-1979 Consultant and Program Developer, California Coastal
 Conservancy, Oakland, California. Evaluation of
 local projects carrying out mandate of State Coastal
 Act, including project feasibility and design.

1973-1978 Community Development Representative, Department of
 Housing and Community Development, State of
 California, Sacramento. Formulation of the State's
 Urban Strategy, transportation and housing policies
 and programs in coordination with other State
 agencies; specialist in renewal, block grants,
 surplus lands.

1971-1973 Assistant Director, Fresno Redevelopment Agency,
 Fresno, California. Project responsibilities
 included a Neighborhood Development Program for an
 area with a population of 25,000; Central Business
 District renewal; tax increment housing production
 (400 units).

1970-1971 Planning Director and Associate, General Resource
 Planning Consultants (later merged with Alan Vorhees
 Associates), St. Louis, Missouri, and Chicago,
 Illinois. Environmental and economic development
 planning.

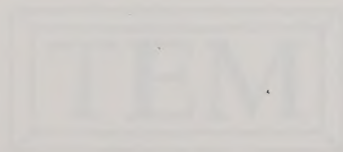
- 1968-1970 Deputy Director, City of Newark Planning Department, Newark, New Jersey. Supervision of department and Model Cities staff in formulating and administering renewal, employment, investment generation and transportation programs.
- 1966-1968 Principal Planner, Baltimore City Planning Department, Baltimore, Maryland. Preparation of regional design and transportation network plan; renewal plan; proposal for first New Town In Town.
- 1964-1966 Association with Center for Planning and Development Research, University of California, Berkeley. Drafting of several research proposals including Urban Land Bank. Other professional writing.
- 1963-1964 Research Staff, Arthur D. Little, Inc., San Francisco, California. Preparation and testing (including computer modeling) for the City and County of San Francisco.
- 1960-1970 Consultant, General Planning and Resource Consultants, Chicago, Illinois. For the decade I performed selected work as an associate of this firm. Contracts included several general plans, zoning ordinances, and capital budgets for Illinois cities, including Oak Park, Oak Brook, and Lake Springfield.
- 1959-1960 Senior Planner in Charge, Urban Renewal Section, Pittsburgh, Pennsylvania. Primary responsibility for Citywide and Community renewal programs; supervision of staff of seven.
- 1958 Technical Assistant in the Policy and General Division of the Planning Section of the Architect of the London County Council, London, England. Preparation of Preliminary Transportation Plan, and several area development plans.
- 1954-1956 Intermediate City Planner, Long Range Division, Detroit City Plan Commission, Detroit, Michigan. Major contribution to Port and CBD Plans, and participation in Industrial Areas Plan and transportation studies.
- 1952-1954 Assistant to the Director, Ann Arbor City Planning Commission, Ann Arbor, Michigan. Coverage of all aspects of planning for an academic community of 60,000.

electric technology. In addition, the TEM solar project team can provide site analyses and resource assessments for solar thermal systems and design work on optical concentrators for solar thermal applications.

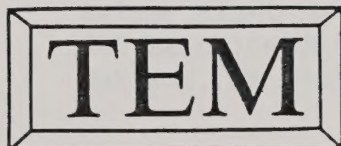
BIOMASS TECHNOLOGY

TEM's expertise in biomass technology includes the planning, analysis and design of biomass conversion systems; the identification of potential biomass products and markets; the characterization of biomass resources in specific locations; and the determination of the market potential of specific resources.

REFERENCES AND FIGURES OF DATA SOURCES



REFERENCES AND EXAMPLES OF RECENT PROJECTS



Associates, Inc.

REFERENCES

- o Design and development of an advanced technology program and curriculum to be used by the School of Opportunity, for Operation Second Chance, Inc., San Bernardino, California. The School of Opportunity will offer training programs for young people entering the labor force as well as for displaced workers and others wishing to acquire new skills and training in order to cope with the rapid transformation of the national economy towards jobs requiring capabilities in high technology.

Contact: Wesley Jefferson
Chief of Operations
341 W. Second Street
San Bernardino, CA 92402
(714) 884-8764

- o Development of a Plan to Attract High-Technology Industry and Research and Development Companies to the City of Oakland, California, for the City of Oakland. An economic development study and proposal for revitalizing Oakland's economic base by stimulating the growth of high technology industries. TEM Associates has served as principal consultants to the City Office of Economic Development and Employment in developing a comprehensive strategy and specific action plans for attracting emerging high technology firms to locate research, manufacturing, and administrative offices within Oakland. Additional planning has served to prepare strategies for local development of allied support industries to provide required capabilities to high technology industries and job opportunities for Oakland's large pool of unemployed labor.

Contact: Bernie Choden
Planner
Office of Economic Development
City of Oakland
1417 Clay Street
Oakland, CA
(415) 273-3020

- o Study to Determine the Feasibility of Developing and Marketing a Superior Quality Powered Wheelchair and of Manufacturing It in a Facility Owned and Operated Substantially by Disabled People, for Kaiser Aluminum and Chemical Company. A marketing and manufacturing feasibility study.

Contact: Walt Joseph
Kaiser Aluminum & Chemical Corporation
300 Lakeside Drive
Oakland, CA 94673

- o Technical Assistance for the Revitalization of Communities (TARC), for the U.S. Department of Labor, Region IX. Working in conjunction with the Institute of Regional and Urban Development of the University of California at Berkeley, TEM is the principal consultant providing technical assistance to CETA Prime Sponsors and Private Industry Councils, many of whom are city- and county-managed. The objective of the TARC Project is to assist the Prime Sponsors and PICs initiate projects and achieve better coordination and integration among public and private resources undertaking local economic development programs.

Contact: Carolyn Golding
Regional Adminsitrator
U.S. Department of Labor
San Francisco, CA 94102
(415) 556-1541

- o Survey of hydrologic resources in the United Republic of Cameroon, for Stuart-Carter International, Seattle, Washington. A study of water resources (rainfall, water tables, surface flow, soil retention, river systems), population distribution, current water systems, public health implications of such systems, and government planning of water resources, for a manufacturer of water purification and waste water treatment units.

Contact: Randy Carter
Stuart-Carter International
1507-C Queen Anne Avenue north
Seattle, Washington 98109
(206) 282-2638

- o Environmental Assessment for the Consumer Products Efficiency Standards Program, for the U.S. Department of Energy. An integrated technical/socio-economic analysis of the effects on the environment, on the consumer, on manufacturers, and on the economy of proposed federal energy-efficiency standards for all major home heating and cooling equipment and appliances.

Contact: Robert Salazar
Department of Energy, SAN Office
1333 Broadway
Oakland, CA
(415) 273-7963

- o Design, Development and Fabrication of an "Artificial Sky," for the University of California's Lawrence Berkeley Laboratory (LBL). Part of the LBL R&D program on windows and lighting, this facility will have the capability of simuating illumination from the sun and sky for architectural and environmental modeling and design purposes.

Contact: Steve Selkowitz
Windows and Lighting Manager
Lawrence Berkeley Laboratory
Berkeley, CA 94720
(415) 486-5064

EXAMPLES OF OTHER RECENT PROJECTS

The following are synopses of selected work currently and recently performed by TEM's staff and associates.

- o Environmental Impact Statement for the Proposed Louisiana World Exposition (1984), for the U.S. Department of Commerce. A major environmental document that assesses and analyzes the socio-economic and fiscal impacts and benefits and environmental effects of the proposed 1984 Louisiana World Exposition on the City of New Orleans, the State of Louisiana, and on contiguous States and regions. Included in this EIS is an analysis of the economic and social consequences of the Exposition on affected businesses, manufacturing companies, and workers in New Orleans, and an evaluation of the housing accommodations in the region for visitors to the Exposition.
- o Feasibility Study, for the Vermont Electric Power Company. A determination of the feasibility of developing and implementing a surveillance program to measure and evaluate health effects related to high voltage transmission line operation.
- o Environmental Study of the Impact of the Proposed Standards of the Consumer Products Efficiency Standards Program on Future U.S. Consumption of Chlorofluorocarbons (CFCs), for the U.S. Department of Energy. An analysis and assessment of the environmental effects of increases in CFCs resulting from a major government program to establish standards of efficiency for home heating and cooling equipment and household appliances.
- o Proposal Review and Training Seminars for State Reviewers for the U.S. Department of Energy's Appropriate Technology Small Grants Program, for the U.S. Department of Energy, Region I, New England. Review, evaluation, monitoring and control of proposals submitted to Region I for awards for the Appropriate Technology Small Grants Program for the 1981 cycle. Organization and presentation of training sessions for state reviewers.
- o Environmental Assessments for Rulemaking and Related Subjects under the National Environmental Policy Act (NEPA), for the Federal Energy Regulatory Commission (FERC). Environmental assessments prepared for FERC rulemakings, which include economic analysis, energy demand/supply forecasting and market penetration studies for new technologies.
- o Evaluation of Potential Effect of Efficiency Standards on the

Utility and Performance of Clothes Washers, Dishwashers, Television Sets and Heat Pumps, for Science Applications, Inc. An analysis of the effects on product performance and utility of proposed design options for improving the energy efficiency of these four appliances covered by the Department of Energy's Consumer Products Efficiency Standards (CPES) Program.

- o Environmental Assessment for the Proposed Louisiana World Exposition, 1984, for the U.S. Department of Commerce. An environmental/socio-economic analysis of the effects of developing a major exposition site along the New Orleans waterfront.
- o Survey of the Biological Effects of Very-High-Voltage Transmission Lines, for the Minnesota Environmental Quality Board. A study of environmental hazards of multi-hundred-kilovolt ac and dc transmission lines, including the effects of induced electric shock, prolonged exposure to electromagnetic fields, and exposure to air ions generated by these lines.
- o Modification of an Activated Sludge Plant, for a local municipality. This 20 MGD activated sludge plant treating a mixture 50% domestic and 50% industrial waste was experiencing severe activated sludge bulking and solids handling problems. After modification, the plant has produced an effluent with BOD and SS averaging below 10 mg/l and has twice won "Plant of the Year" awards.
- o Analysis of Indigenous Renewable Resources in California's Future, for the U.S. Department of Energy. Evaluation of demand and supply options, with heavy emphasis on cost-effective conservation measures and on the available resource base for new renewable resource technologies.
- o Design, Development and Fabrication of an Optical Comparator for Testing Printed Circuit Boards (PCB's), for an electronics firm. A device that optically compares a manufactured PCB with a master, allowing for rapid and effective testing and quality control.
- o Development of a Spectrophotometric System for Measurement of Small Changes in Optical Density, for the National Science Foundation. A system used to investigate the nature of the photosynthetic process in green plants and algae.
- o Options for Modifications of Refrigerators and Air Conditioners to Improve Energy Efficiency, for the U.S. Office of Technology Assessment. Preparation of a background document investigating options for improving these appliances' efficiency and permitting their integration into rehabilitated and new buildings.
- o Options for Altering Land Use Patterns to Increase Energy Productivity, for the U.S. Department of Housing and Urban Development. Study of actual experience of small cities and its extrapolation to larger cities.
- o Preparation of a Program Manager's Procurement Guidebook for the

Business Management Branch Chief, Office of Management and Budget Support, Conservation and Solar Energy Division, for the Department of Energy. A procurement manual for the Program Manager which includes: procurement requirements and activities; loan guarantees and agreements; cooperative agreements; and administrative directives and orders.

- o Evaluation of Small and Disadvantaged Business Program Policies and Directives for the Business Management Branch Chief, Office of Management and Budget Support, Conservation and Solar Energy, for the Department of Energy. An analysis of all current directives, orders, letters, policies and Congressional actions to assist Conservation and Solar Energy in its effort to improve its small and disadvantaged business program.
- o A Tracking and Analysis Program, for Qualifying Cogeneration and Small Power Production Facilities, for the Federal Energy Regulatory Commission (FERC). A program to monitor the facilities that qualify for FERC incentives for cogeneration and small power production to provide early warning to environmental agencies of the potential need for action to protect the environment.
- o An Educational Program for the Staff of the Federal Energy Regulatory Commission, for the Federal Energy Regulatory Commission (FERC). An ongoing series of educational seminars on environmental issues by and for the FERC staff to train and upgrade FERC's personnel according to its policy guidelines and mission.
- o Legal Analysis for the Federal Energy Regulatory Commission (FERC), for FERC. An analysis of the legality of the use of third party consultants in the preparation of environmental impact statements.
- o Support Services for the Advisor on Environmental Quality, Federal Energy Regulatory Commission. Services include assessment of environmental impacts of proposed regulations and analysis of emerging energy and environmental policy issues.
- o Analysis of the Effect of Uncertainty on Investment Decisions in Energy Conservation, for the California Policy Seminar. Development of a theoretical framework for considering the types of uncertainty characterizing the present energy market, leading to recommendations for optimal investment strategies in view of this uncertainty.
- o Assessment of the Benefits and Costs of Establishing a Municipal Utility, for the City of Davis, California. Review of options for the City and recommendations for a course of action.
- o Development of a Methodology for Evaluating Proposals, for the U.S. Office of Small Scale Technology. Development of a procedure now being used routinely by the Department of Energy nationwide.
- o Study of the Biological Effects of Light on Humans, for the Lawrence Berkeley Laboratory (LBL). A project to assist in the design of experiments and apparatus for determining the bio-

chemical, psychophysiological and psychological response of humans to light.

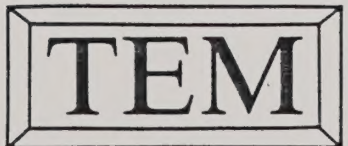
CLIENTS

The following are some of the clients who have entrusted TEM Associates, Inc. with their environmental consulting needs:

- U.S. Department of Energy
- Federal Energy Regulatory Commission
- U.S. Department of Defense
- American Nuclear Energy
- American Environmental Quality Fund
- American Environmental, Inc.

CLIENTS

- Federal Energy Regulatory Commission
- U.S. Department of Labor
- American Nuclear Energy
- City of Denver, Colorado
- U.S. Environmental Protection Agency
- Columbia Regional Health Agency, Washington, D.C.



Associates, Inc.

CLIENTS

TEM Associates' Principals and staff have as recent and current clients:

- o U.S. Department of Energy
- o Federal Energy Regulatory Commission
- o U.S. Department of Commerce
- o Lawrence Berkeley Laboratory
- o Minnesota Environmental Quality Board
- o Science Applications, Inc.
- o Kaiser Aluminum and Chemical Company
- o Vermont Electric Power Company
- o U.S. Department of Labor
- o Operation Second Chance
- o City of Oakland, California
- o U.S. Small Business Administration
- o California Regional Small Business Development Corporation

STEVEN R. WILSON President, TEM Associates, Inc.

EDUCATION: B.S., Physics (1962), University of California
M.S., Engineering (1963), University of California
Ph.D., Engineering (1965), University of California, Berkeley

PROFESSIONAL HISTORY:

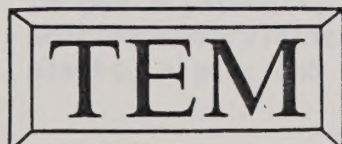
1965-1970 President of TEM Associates, Inc. Responsible for the activities of the firm in the areas of research, development, and engineering. In addition, he has been responsible for the firm's financial and administrative affairs, and has been a member of the Board of Directors of the firm.

RESUMES OF PROJECT TEAM MEMBERS

1970-1971 Vice President and Chief Scientist, TEM Associates, Inc. Responsible for the firm's research and development activities, and for the firm's financial and administrative affairs. In addition, he has been responsible for the firm's engineering activities, and has been a member of the Board of Directors of the firm.

1971-1972 Professional Development Program, University of California, Berkeley. Director of an intensive research program designed to advance the state of the art in the field of engineering. In addition, he has been responsible for the firm's financial and administrative affairs, and has been a member of the Board of Directors of the firm.

1972-1973 Department of Civil Engineering, University of California, Berkeley. Researcher in the field of structural engineering. In addition, he has been responsible for the firm's financial and administrative affairs, and has been a member of the Board of Directors of the firm.



Associates, Inc.

BERAH D. McSWAIN
President, TEM Associates, Inc.

EDUCATION:

B.S., Optics (1956), University of Rochester

M.S., Engineering (1962), University of Rochester

Ph.D., Biophysics (1968), University of California,
Berkeley

PROFESSIONAL HISTORY:

Present	President of TEM Associates, Inc. Responsible for the scientific performance of all TEM Associates' work. Direction of and participation in projects on environmental analysis, daylighting and illumination, solar energy technology, energy conservation, and biological effects of non-ionizing radiation.
1979-1981	Vice President and Chief Scientist, Dow Associates; and Visiting Research Scientist, Energy and Environment Division, Lawrence Berkeley Laboratory. Research, development and demonstration activities in energy conservation. Studies of optimal methods of solar and artificial illumination, including investigations of new techniques, processes and prototypes. Design, supervision of fabrication, and application of instrumentation for energy efficient lighting and windows research; testing and evaluation of new materials and products.
1976-1979	Professional Development Program, University of California, Berkeley. Director of an Academic Senate program designed to enlarge opportunities for students (especially minorities and women) at all educational levels; development of budgetary sources, preparation of funding proposals and direct participation in grant negotiations with private foundations, corporations, state and federal agencies. Design, evaluation and documentation of educational projects; supervision of the development of special classes, workshops and symposia.
1962-1976	Department of Cell Physiology, University of California, Berkeley. Basic research in photosynthesis; studies of the nature and efficiency of the primary processes of energy conversion in photosynthesis; design of optical and electro-optical equipment to be used in research in photosynthesis. Investigations of electron transport, photophosphorylation and other biological processes in plants, algae, and bacteria.

PROFESSIONAL HISTORY (continued):

- 1961-1962 University of Rochester, Rochester, New York. Basic and applied research on the physical, chemical and optical properties of materials; studies of structures of non-vitreous substances. Design of illumination systems and light detection systems. Consulting in optics, optical engineering, radiometry and photometry.
- 1958-1961 U.S. Naval Ordnance Laboratory, Corona, California. Design of optical systems and novel electro-optical devices; basic research on physical properties of optical materials and detectors; laboratory and field studies of guidance and fusing systems.
- 1956-1958 Northrop Aircraft, Inc., Anaheim, California. Operation and supervision of an engineering laboratory; design of instrumentation, testing and evaluation of prototypes, establishment and maintenance of laboratory standards and quality control.

PUBLICATIONS:

"Evidence for Two Types of P 700 in Membrane Preparations from a Blue-Green Algae," with T. Hiyama and D.I. Arnon, Biochem. Biophys. Acta 460, pp. 76-84, (1977).

"Net Electron Flow and the Oxydation-Reduction Level of an Electron Carrier," with T. Hiyama and D.I. Arnon, Biochem. Biophys. Acta 460, pp. 65-75, (1977).

"Analysis of Electron Flow through P 700", with T. Hiyama and W. Ufert, Am. Soc. Plant Physiol. (1976).

"Simultaneous Measurement of Oxygen Concentration and Absorbance Changes," with T. Hiyama and W. Ufert, Analyt. Biochem. 76, pp. 365-368 (1976).

"Light-Induced Cytochrome Changes in Blue-Green Algae," with H. Y. Tsujimoto et al., Biochem. Biophys. Acta 423, pp. 313-322 (1976).

"The Effect of Oxydation-Reduction Potential on the Fluorescence Yield of Spinach Chloroplasts at 77° K.", with R. Malkin and D.B. Knaff, FEBS Letters 47, pp. 140-142 (1974).

"Photochemical Activity and Components of Membrane Preparations from Blue-Green Algae I. Coexistence of Two Photosystems in Relation to Chlorophyll and a Removal of Phycocyanin," with D. I. Arnon et al., Biochem. Biophys. Acta 357, pp. 231-245 (1974).

"Developing Opportunities in Graduate Minority Education," Proceedings

PUBLICATIONS (continued):

from the National Conference on Graduate Minority Education, University of California Press (1973).

"Role of Cytochromes and other Metalloproteins in the Photosynthetic Electron Transport," with D.I. Arnon et al., in Structure and Function of Oxidation Reduction Enzymes, Oxford: Pergamon Press (1973).

"Factors Influencing Photosynthetic Enhancement in Isolated Chloroplasts," with D.I. Arnon, BBRC 49, pp. 68-75 (1972).

"Some New Aspects of Enhancement in Photosynthesis," with D. Arnon, Sixth International Congress on Photobiology, Bochum, Germany, p. 292 (1972).

"Photosynthetic Electron Transport and Phosphorylation Induced by Three Light Reactions in Chloroplasts," with D. I. Arnon et al., in Energy Transduction in Respiration and Photosynthesis, Bari: Adriatica Editrice pp. 237-268 (1971).

"Action Spectra of the Three Light Reactions in Photosynthesis," with D. B. Knaff, Biochem. Biophys. Acta., 245, pp. 1051-1056 (1971).

"Three Light Reactions and the Two Photosystems of Plant Photosynthesis," with D. I. Arnon et al., Petrochem. Photobiol., 14, pp. 377-425 (1971).

"Partial Separation of the Three Light Reactions of Photosynthesis by Disrupted Chloroplasts," with R. K. Chaim and H. Y. Tsujimoto, ASPP Western Section (1970).

"Separation of Two Photochemical Systems of Photosynthesis by Fractionation of Chloroplasts," with D. I. Arnon and H. Y. Tsujimoto, in Comparative Biochemistry and Biophysics of Photosynthesis, University of Tokyo Press, pp. 113-131 (1968).

Quantum Requirements and Enhancement Effects of Photosynthetic Electron Transport in Chloroplasts, Ph.D. Thesis, U.C. Berkeley (1968).

"Ferredoxin and Photosynthetic Phosphoration," with D. I. Arnon and H. Y. Tsujimoto, Nature, 214, pp. 562-566 (1967).

"Differential Effects of Desaspidin on Photosynthetic Phosphorylation," with H. Y. Tsujimoto and D. I. Arnon, Plant Physiology, 41, pp. 1376-1380 (1966).

"Photosynthetic Phosphorylation and Electron Transport," with D. I. Arnon and H. Y. Tsujimoto, Nature, 207, pp. 1367-1372 (1965).

"Role of Ferredoxin in Photosynthetic Production of Oxygen and Phosphorylation by Chloroplasts," with D. I. Arnon and H. Y. Tsujimoto, Proc. Nat. Acad. Sci., 51, pp. 927-934 (1965).

PUBLICATIONS (continued):

"Comparison of Ferredoxin Dependent Reactions in Isolated Chloroplasts and in Extracts of a Photosynthetic Bacterium," with D. I. Arnon et al., Science, 146, p. 422 (1964).

"Oxygen Evolution Coupled with Photoreduction of Ferredoxin by Chloroplasts," with D. I. Arnon and H. Y. Tsujimoto, Science, 146, p. 422 (1964).

"Infrared Spectra of Vitreous Boron Oxide and Sodium Borate Glasses," with N. F. Borrelli and G-J. Su, Phys. Chem. of Glass, 4, pp. 11-21 (1963).

"The Effect of Composition and Temperature on the Ultra Violet Absorption of Glass," with N. F. Borrelli and G-J. Su, Phys. Chem. of Glass, 4, pp. 1-10 (1963).

Effects of Temperature on the Absorption of Glass, Master's Degree Thesis, University of Rochester (1962).

"Infrared Spectra of Borate Glasses," with G-J. Su and N. F. Borrelli, Phys. Chem. of Glass, 3, p. 139 (1962).

"Specular Reflectance of Water in the 1.5 to 15 micron Region, with J. Bernstein and V. Patton, JOSA, 51, p. 1477 (1961).

"Optical Properties of Sea Water," with J. Bernstein, NAVWEPS Report 7169, NOLC 539 (1960).

In addition, Dr. McSwain is a member of a number of professional societies. He has served as Principal Investigator or Project Manager on many projects, including the following:

Environmental Assessment for the Proposed Louisiana World Exposition (1984), prepared for the U.S. Department of Commerce (March 2, 1981).

Developing and Marketing a High-Performance Powered Wheelchair: A Feasibility Report, prepared for Catholic Charities, Diocese of Oakland, California, and Kaiser Industries (January 16, 1981).

Potential Effect of Efficiency Standards on the Utility and Performance of Clothes Washers, Dishwashers, Television Sets and Heat Pumps, prepared for Science Applicatons, Inc., La Jolla, California (December 1980).

Biological Effects and Physical Characteristics of Fields, Ions, and Shock, prepared for the Minnesota Environmental Quality Board (September 1980).

Environmental Assessment for the Consumer Products Efficiency Standards Program, prepared for the U.S. Department of Energy (June 1980).

A Tracking and Analysis Program, for Qualifying Cogeneration and Small Power Production Facilities, prepared for the Federal Energy Regulatory Commission (Spring 1981).

An Educational Program for the Staff of the Federal Energy Regulatory Commission, prepared for the Federal Energy Regulatory Commission (ongoing).

Development of a Plan to Attract High-Technology Industry and Research and Development Companies to the City of Oakland, California, prepared for the City of Oakland (in progress).

1973-1974 Consulting Engineer, Federal Practice, San Francisco, California.

Advisor to business and government on technical and policy issues, specializing in energy. Projects included evaluating the potential of fuel alcohol production plants; developing marketing plans for energy technology; evaluating Federal government energy programs; evaluating energy-related proposals for state agencies; advising management consulting firms on how to develop business in energy and technology; preparing proposals for state clients; advising public and private financing of energy projects; and formulating lists of applicants for federal loans.

1976-1978 Program Manager and Engineer, U.S. Department of Energy, San Francisco, California.

Directed program and worked closely with research and development work in energy conservation as well as in fossil and geothermal energy. Responsibilities included: developing a national and national program directed toward individual operators and small businesses; managing city and multi-state marketing program in the Western United States; managing major portions of a national program for the collection of resources; managing construction of a new coal refinery; managing oil recovery; and geothermal energy research, administering an annual award of about \$100,000 to encourage research in geothermal energy program.

1978 Associate Director, National Systems Training Institute, U.S. Civil Service Commission, San Francisco, California.

Directed all engineering and environmental training program sponsored by the Civil Service Commission in the Western Region. Responsibilities included developing curricula and teaching materials, contracting with and managing instructors and teaching centers.

THOMAS L. CHESTER, Associate
TEM Associates, Inc.

EDUCATION: B.S., Mechanical Engineering (1971), University of
 Oklahoma

 M.S.E., Mechanical Engineering (1972), University of
 Michigan

PROFESSIONAL HISTORY:

1979-Present Consulting Engineer, Private Practice, San Francisco,
 California.

Advisor to business and government on technical and policy issues, specializing in energy. Projects included evaluating the potential of fuel-alcohol production plants; developing marketing plans for energy inventions; assessing federal government energy programs; evaluating energy-related proposals for state agencies; advising management consulting firms on how to develop business in energy and technology; preparing proposals to help clients obtain public and private financing of energy projects; and forensic analysis of accidents in liability cases.

1976-1979 Program Manager and Engineer, U.S. Department of Energy,
 San Francisco, California.

Directed programs and managed contracts for research and development work in energy conservation as well as in fossil and geothermal energy. Responsibilities included: developing a regional and national grants program directed toward individual inventors and small businesses; managing this same small-scale technology program in the Western Federal Region; developing major portions of a national management plan for enhanced oil recovery; managing contracts in in situ coal gasification, enhanced oil recovery, and geothermal energy research; participating on procurement boards to select government contractors in fossil and geothermal energy programs.

1976 Associate Director, Management Sciences Training Institute,
 U.S. Civil Service Commission, San Francisco, California.

Directed all engineering and environmental training programs sponsored by the Civil Service Commission in the Western Region. Responsibilities included developing curricula and teaching materials; contracting with and managing instructors; and teaching courses.

PROFESSIONAL HISTORY (continued):

1974-1976 Director of College Relations, College of Engineering,
University of Oklahoma, Norman, Oklahoma.

Managed all college programs relating to public information, alumni relations, student recruitment and placement, cooperative education, and fund raising. Responsibilities included: directing a cooperative education program placing students in business and government jobs while they were still in school; managing the alumni relations program; coordinating all media information; recruiting prospective students; coordinating the placement of graduating students; editing the alumni magazine and other publications.

1973-1974 Engineer, AMOCO Production Company, Oklahoma City, Oklahoma.

Performed petroleum engineering analyses, including evaluation of oil and gas wells for repair potential; economic evaluation of projects; drilling and well completion work; and equipment design. Major responsibilities included: all engineering for an oil field with 200 wells and production exceeding 5,000 barrels of oil per day, and designing and managing the installation of a radio alarm system for 50 gas wells.

HONORS AND ACTIVITIES:

Awarded nine undergraduate scholarships (graduated cum laude) and three graduate fellowships. Member and officer in more than a dozen college organizations and named to the honor roll every semester. Named outstanding senior in engineering.

PROFESSIONAL AFFILIATIONS:

Registered Professional Engineer (California and Oklahoma)

Member, Board of Directors, Golden Gate Energy Center, a non-profit corporation established in the Golden Gate National Recreation Area to provide information and educational programs on energy.

ALAN J. GOULD
Attorney-at-Law and Vice President, TEM Associates, Inc.

EDUCATION: Psychology (1950), Syracuse University

 Psychology (1951), Sienna College

 L.L.B., Law (1954), Albany Law School, Union University

 Public Administration (1961), New York State
 Graduate School of Public Affairs

 L.L.M., Government Procurement (1964), George Washington
 University/National Law Center

EXPERIENCE SUMMARY:

Mr. Gould was General Counsel to Teknekron, Inc.; TERA Corporation; ROI Consulting, Inc.; and Insurance Technology Company; as well as head of the firm's Government Operations Activities Division, which provided specialized services in the field of government operations and organization to state, municipal and quasi-government organizations. Mr. Gould was responsible for all the legal activities of the corporations and for contract drafting, negotiation and administration.

Mr. Gould's extensive experience includes ongoing consultancies to the American Bar Association for the development of a Model Procurement Code for states and municipalities. Mr. Gould was Code Coordinator for the Model Procurement Code Project under a grant from the Law Enforcement Assistance Administration and is currently Vice Chairman of the California Committee for the Model Procurement Code Project.

As former Contract Manager, Washington Operations, TRW, Inc., Mr. Gould has broad experience in the development, specification and procurement of management information systems, and the development of environmental, energy and strategic planning programs.

Mr. Gould has represented clients in disputes and litigation with Federal Government Agencies and has appeared before Boards of Contract Appeals, the U.S. Court of Claims, and the GAO. He is thoroughly familiar with all aspects of federal, state, and municipal procurement activities. As General Counsel for Teknekron, Inc., and affiliates, Mr. Gould was responsible for, among other things, the formulation, negotiation and management of commercial business relationships and contracts for major non-government projects.

As a senior contracting officer, Ordnance Systems Command, Navy Department, Washington, Mr. Gould negotiated and managed major weapons systems acquisitions. Mr. Gould was responsible for individual contracts of a magnitude of \$50,000,000 to over \$100,000,000.

PROFESSIONAL HISTORY:

1974-1978 General Counsel to Teknekron, Inc., responsible for all legal, contractual and financial corporate management.

1969-1974 Contract Manager, Washington Operations, TRW, Inc., Management Information Systems, environmental programs, strategic planning programs.

1966-1969 Director of Contracts, Division Counsel, Maxson Ordnance Division, Maxson Electronics Corporation, Macon, Georgia. Production ordnanace products.

1962-1966 Senior Contracting Officer, Bureau of Naval Weapons, Navy Department, Washington, D.C.; graduate Navy Management Intern Program.

1955-1962 Private practice (law), Albany, New York.

PROFESSIONAL ASSOCIATIONS:

Member of the Bars of the State of New York, District of Columbia, U.S. Supreme Court, U.S. Court of Claims and State of California.

Former special legal adivsor to the Commission on Government Procurement.

Member of the American Bar Association, the Federal Bar Association, and the National Contract Management Association.

Chairman, Committee on Research and Development, Public Contract Law Section, American Bar Association (1975-1976).

Staff Lecturer, Government Contract Law, U.S. Postal Service Management Institute (1971-1974).

Chairman, Colonie, New York, Planning Commission and Municipal Counsel (1960-1962).

Certified Professional Contract Manager (CPCM), National Contract Management Association.

PUBLICATIONS:

"The Contracting Officer's Role in the Settlement of Government Contract Disputes and Claims," NCMA Anthology, 1 (1970).

...nued):

"Exculpatory Clauses in Government Contracts," Capitol Comments (1971).

"Government Contract Management," USPSMI (1971).

ALBERT GOLDSCHMIDT, Associate
TEM Associates, Inc.

EDUCATION: B.A., Government, San Francisco State
 College

 M.A., Public Administration, University of
 California, Berkeley

 Certificate, Program for Industrial Development

PROFESSIONAL HISTORY:

1980- Senior Financial Consultant, Public Finance, Birr,
 Present Wilson & Co., Inc., San Francisco, California.

1978-1979 Senior Financial Consultant, Public Finance, Morgan,
 Olmstead, Kennedy & Gardner, San Francisco.

1976-1978 Financial Consultant, Public Finance, Miller &
 Schroeder, La Jolla, San Francisco.

1973 and Lecturer, Graduate School of Landscape Architecture,
 1975 University of Mexico, Mexico City.

1972-1976 Municipal Financing Consultant, Bartel Wells
 Associates, San Francisco.

1969-1972 Self-employed financing and management consulting;
 management of mini-conglomerate in Vancouver,
 Canada, for U.S. owners.

1969 Bank Investment Securities Division, Institutional
 Sales and Municipal Credit Analysis, Bank of
 America, NT & SA.

1967-1968 Midas Muffler, San Francisco. Financial counsellor
 to the franchisees in the Western United States;
 regional credit manager; manager of cooperative
 radio advertising funds.

1963-1967 Municipal Financing Consultant, Stone & Youngberg.

PROFESSIONAL EXPERIENCE:

During my municipal financing career with Stone & Youngberg; Bank of America; Bartle Wells Associates; Miller & Schroeder; Morgan, Olmstead, Kennedy & Gardner; I have assisted with the financing of sewers, bridges, port facilities, water, parking, hydroelectric, hospital, housing, soil waste management, and

public buildings projects. My experience extends to the use of general obligation bonds, revenue bonds, assessment bonds, industrial development bonds, and certificates of participation in leases. My profession is revenue stream identification, creation, and mortgaging. Through the use of tax-exempt debt instruments, my professional expertise enables me to use the tools provided by state and local government to finance capital improvements using voted and non-voted municipal debt instruments.

PUBLICATIONS:

"Non-Aesthetic Aspects of Roof Gardens," University of Mexico, Seminar in Landscape Architecture (197).

"Alternative Soil Materials," University of Mexico, Seminar in Landscape Architecture (1973).

LESLIE J. MAY, Associate
TEM Associates, Inc.

PROFESSIONAL HISTORY:

1980- Owner and operator of Leslie J. May & Company,
Present dealers and installers of wind energy energy
 conversion systems.

Installed the first wind energy system in Berkeley,
California, designed as a prototype for energy
conservation. The system supplies energy for
residential use.

Organized Energy Pass Corporation (a state
registered corporation) for the purpose of
establishing windfarms in the Altamont Pass, the
Sonoma Mountains and Mt. Hamilton.

Lecture to municipal energy committees and home
associations on wind energy systems as an energy
alternative.

1979-1980 Project Manager for the rehabilitation of a
 multi-unit apartment complex in East Contra Costa
 County. Negotiated with and selected all
 sub-contractors for the project. Purchased all
 supplies and equipment for the project. Maintained
 all books and records, including payroll.
 Coordinated administrative duties with project
 developers, including the acquisition of permits
 necessary for project completion.

1976-1978 Owned and operated L.J. May Painting Contractor.
 Responsible for all facets of the operation
 including cost analysis for project bidding, hiring
 of employees, complete record keeping, and the
 negotiation of project financing.

RELATED TRAINING AND SCHOOLING:

Alternative Energy Seminars (windmills) sponsored by
Arrow Power Systems, Inc. Trained with Arrow to
become a manufacturers representative. Areas of
study included characteristics and nomenclature of
wind generated systems; proper assembly of wind
systems and towers of varying types; maintenance of
all components; site analysis; marketing; consumer
relations; presentation; and installation.

PROFESSIONAL AFFILIATIONS:

Chairman, Public Affairs Committee of the California Wind Energy Association. The association is dedicated to the promotion of safe and intelligent use of wind energy.



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Chairman, Public Utility Commission of the District of Columbia
Wind Energy Administration. The Commission is
interested in the possibility of using wind energy
use of wind energy.